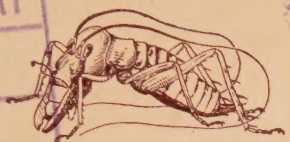
Vol. 2. No. 4. December, 1959.

COMMONWEALTH INST.
ENTOMOLOGY LIBRARY
12 MAY 1960
SERIAL Aus. 46
SEPARATE

E & A



THE NEW ZEALAND ENTOMOLOGIST

THE JOURNAL OF THE ENTOMOLOGICAL SOCIETY OF NEW ZEALAND.

PUBLISHED BY THE SOCIETY.

COPIES OBTAINABLE FROM THE EDITOR.

Price: Five Shillings

THE ENTOMOLOGICAL SOCIETY OF NEW ZEALAND

OFFICERS:

President: R. A. HARRISON, M.Sc.
Plant Diseases Division, D.S.I.R., Auckland

Vice-President: J. M. HOY, M.Agr.Sc.,
Entomology Division, D.S.I.R., Palmerston North

Secretary-Treasurer: A. D. LOWE,
Entomology Division, c/o Crop Research Division,
D.S.I.R., Private Bag, Christchurch

Editor: B. B. GIVEN, M.Sc.,
Entomology Division, D.S.I.R., P.O. Box 223, Nelson

THE BALANCE OF NATURE

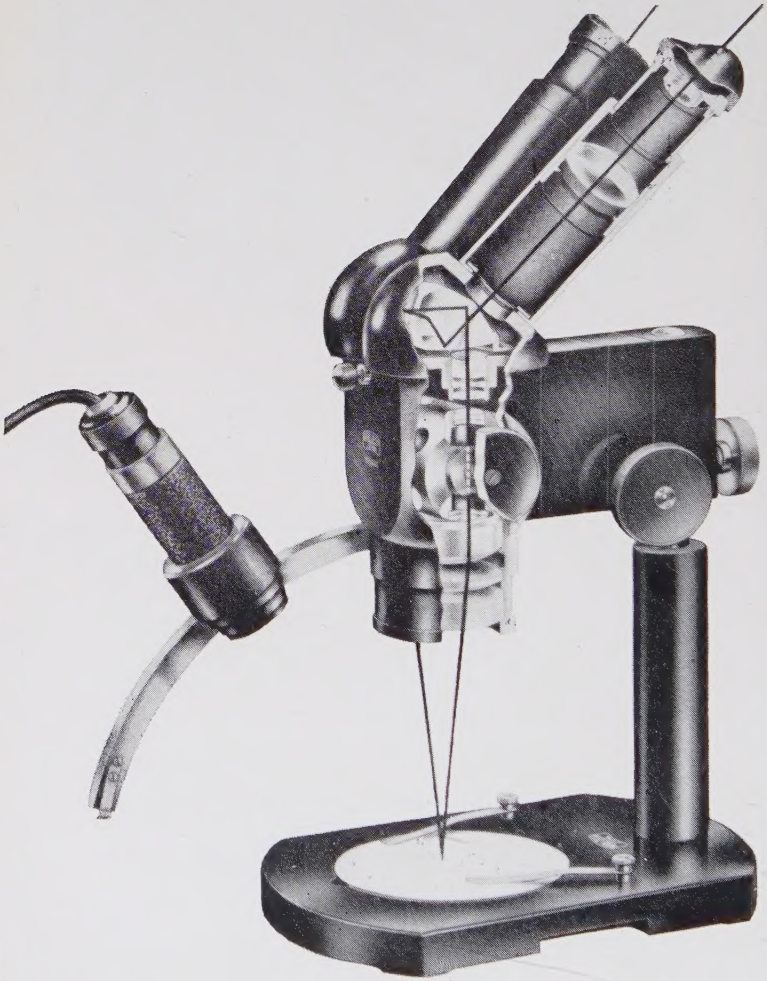
The New Zealand Forest Service's programme of planned forestry calls for the services of research entomologists. Their knowledge of the life-cycle and control of forest insects and diseases, which they study constantly, enables these scientists to check any insect species or any fungus that becomes active to the detriment of forest health. It may be that a disease-causing insect population increases dangerously in a forest area. An adverse change of this kind in the balance of nature must be corrected in order to forestall a possible epidemic outbreak of disease among the trees. A method of combating a too-numerous insect population is to liberate another insect to prey upon it. It is the task of the Forest Research Institute to specify the type of insect parasite needed, procure it—perhaps import it—and rear it in sufficient numbers for liberation in the affected area. In ways like this the Institute's scientists work to keep our forests sound by keeping nature in balance.

Forestry is forever

Inserted in the interests of forest protection by the New Zealand Forest Service.

FF2.3

A cut-away view to illustrate
construction and optical paths



CARL ZEISS
JENA

STEREO-MICROSCOPE

"SMXX"

In order to obtain the stereoscopic effect of a dissecting microscope, it has been customary since the introduction of these instruments, to combine two complete compound microscopes the optic axes of which are inclined to one another at an acute angle. This type of construction, introduced in 1887 by Zeiss, at the suggestion of Greenough, found general acceptance after the initial scepticism had been overcome. However, it has been known since Abbe that good spatial images can be obtained with a single objective and two oculars. This form has been chosen in designing the "SM XX" as it affords decided constructional and operational advantages.

The "SM XX" is an instrument which can be universally applied to stereomicroscopic research and dissection, as well as to all kinds of investigations in workshop and laboratory. It has the following salient features:

Rapid change of magnification

The desired magnifications are obtained by simply turning a dialling drum, thus dispensing with interchangeable paired objectives.

Constant working distance

The working distance with all magnifications from 4 to 100 x remains at 100mm., an advantage which permits convenient operation without hindrance.

Large, flat fields of view

Fields of view up to 44mm. diameter have been achieved as a result of unique optical construction.

Reversible inclined binocular tube

The inclined binocular tube can be mounted, as desired, in two positions 180 degrees apart.

Pronounced stereoscopic effect

The optical equipment of this instrument produces natural images of outstanding plasticity without eye-strain—even with long continued observation.

Please ask for illustrated literature.

VEB CARL ZEISS JENA

REPRESENTED IN NEW ZEALAND AND ISLAND TERRITORIES BY . . .

PROSTHETIC PROCESSES LIMITED, P.O. BOX 1232, WELLINGTON C.1.

You should use a

WATSON

Low Power, Stereoscopic

MICROSCOPE

Independant Eye-piece focussing

Parfocalled objectives

Sturdily built of the best materials

Complete range of accessories

Lightweight

Guaranteed to give excellent results

WATVIC has an extensive range of high quality MICROSCOPES and SCIENTIFIC EQUIPMENT for both professional and student use. Please write for beautifully illustrated catalogue.

WATSON VICTOR
LIMITED

16 The Terrace, Wellington.

Also at

AUCKLAND — CHRISTCHURCH — DUNEDIN

OVER 70 YEARS OF SERVICE

THE

NEW ZEALAND ENTOMOLOGIST

Vol. 2. No. 4 December, 1959.

Notes on Some Insects and Other Invertebrates Collected in the Tokelau Islands

P. S. Dale

Department of Agriculture, Apia, Western Samoa

The Tokelau Island are a New Zealand administered group of three atolls inhabited by Polynesians. The group lies some 250 miles north of Western Samoa between latitudes 8°30′5 and 9°28′S and longitudes 171°12′ and 172°32′W.

The inhabited islet in each atoll was visited and also one neighbouring islet at each of Atafu and Nukunono atolls. The islet of Fanua Fala in Fakaofo atoll, which is peculiar in having soil introduced from Western Samoa, was not covered on this visit.

The principal food crops growing on the islands are coconuts, ta'amu (*Alocasia* sp.) and breadfruit of which ta'amu is a recent introduction from Samoa and at least some varieties of breadfruit are introductions from Samoa and Ellice Islands of rather longer standing. Bananas and pawpaws have also been introduced from Samoa and though they are well established in special compost gardens they do not materially contribute to the diet.

Since the visit was primarily concerned with agriculture the majority of insects mentioned here were taken from food plants and the mulch associated with them. Pests of stored copra were also collected and a number of flies and beetles were taken on *Morinda citrifolia*, a fleshy-leafed plant forming much of the scattered undergrowth beneath the coconut palms.

I am indebted for determinations and distribution notes to the Commonwealth Institute of Entomology, and to W. H. T. Tams (Pyralidae), J. D. Bradley (Agonoxenidae), V. F. Eastop (Aphididae), I. Gordon (Amphipoda), I. C. J. Galbraith (Mollusca) and A. Vandel (Isopoda).

The following notes are arranged under the host plants or environments of the insects concerned, and are followed by a list in systematic order with notes on distribution.

Cocos nucifera (Coconut Palm)

1. *Agonoxena ? argaula* Meyr. is the only pest of coconuts which is of any economic importance. It is widespread throughout the group (and indeed throughout the Pacific) but the damage it causes is slight. It appears to be fairly well controlled by some parasite, more than half of the pupal cases examined bearing the marks of parasite emergence.

The parasite was not found. It might well be one of the Hymenopterous parasites *Brachymeria* or *Apanteles* which exercise about the same measure of control in other parts of the Pacific.

2. *Graeffia crouani* (Le Guill.) may also occur, as damage characteristic of it was found on the leaflets. The Phasmid itself could not however, be found.

3. *Dihammus* sp. adults are common on the undersides of coconut leaflets but no damage there could be attributed to them.

Alocasia (Ta'amu)

1. *Aphis* (*Cerosipha*) *gossypii* Glover, occurs in small numbers on ta'amu in all three atolls. At Nukunono it was associated with the Coccinellid *Coelophora inaequalis* (F.) which may account for its scarcity on all three atolls though the Coccinellid was not observed at Atafu or Fakaofo.

2. *Pseudococcus* sp. are the commonest pests of ta'amu though the individual plants carry only small populations, mainly along the leaf veins. They are attended by the ant *Pheidole megacephala* Fab. which is no doubt encouraged by the coconut husk mulch in which the plants are grown. No correlation was observed between aphid or mealybug populations and the potash deficiency from which many of the plants suffer.

3. *Musca domestica* L., taken at Atafu.

4. *Scholastes bimaculatus* Hendel, taken at Atafu.

5. *Phytomyza apicata* Mall., taken at Nukunono.

6. Tettigonid nymphs (Listroscelinae) occur sparsely but apparently cause little damage. *Musca* and *Scholastes* probably breed in the surface mulch.

An interesting feature is the apparent absence of any Lepidopterous or Delphacid pests which are the common *Alocasia* pests in Western Samoa whence the planting material was derived.

Musa sapientum (Banana)

1. *Pentalonia nigronervosa* Coq. was the only pest of bananas observed. It occurs in much greater numbers than in Samoa and has apparently been introduced without the natural enemies which maintain the Samoan population at a low level. As the vector of bunchytop virus, *Pentalonia* is of great economic importance presenting a serious threat to banana production in the Tokelaus should the virus be inadvertently introduced.

2. *Cadrema bilineata* De Meij., taken at Nukunono.

3. A few specimens of *Dihammus* sp. were taken on banana leaves but the relationship between the plant and the insect is not clear.

Again the absence of the scabmoth *Nacoleia octasema* (Meyr.) and possible absence of the stem borer *Cosmopolites sordidus* (Germ.) are at least as significant as the presence of the aphids.

Artocarpus altilis (Breadfruit)

1. *Pseudococcus* sp. attended by the ant *Pheidole megacephala* Fab. occur widely in small numbers.

Cecidomyids may be partly responsible for leaf staining which is a common disease on all three atolls.

2. Other insects collected on breadfruit include *Chrysosoma* sp., *Lamenia caliginea* Stal, and *Swezeyia* sp. probably *maurellei* Muir. Peterson, records *L. caliginea* as a pest of *Alocasia* in Guam.

Morinda citrifolia (Nonu, Indian Mulberry)

This plant is of little economic importance. The insects collected on it did not appear to be responsible for any damage and may have been merely sheltering among its ample foliage.

1. *Hardyia* sp. near *australis* Mall.
2. *Homoneura* sp. near *pubiseta* Kerr.
3. *Homoneura* sp. near *nudifrons* Mall.
4. *Dacus* (*Chaetodacus*) sp. near *passiflorae* Frogg. and *facialis* Coq.
5. *Sybra* sp.
6. *Coccinella repanda* Thunb.

Stored Copra

1. *Carpophilus maculatus* Murr. Atafu and Fakaofu.
2. *Carpophilus dimidiatus* (F.). Atafu and Fakaofu.
3. *Necrobia rufipes* (Deg.). Fakaofu.
4. *Anthicus* sp. Atafu.
5. *Pheidole megacephala* Fab. Atafu and Nukunono.
6. *Ephestia cautella* Walk. Atafu and Nukunono.
7. *Periplaneta* sp. Atafu and Fakaofu.
8. Amphipod (Talitridae) from loose copra stacked on foreshore. This is probably a strand scavenger. Atafu.
9. *Ligia* (*megaligia*) *vitiensis* Dana. Fakaofu.

With the exception of Nos. 5, 8, and 9 these pests occur in great numbers, the floor of the copra shed at Atafu being covered in places, where sacks of copra had been moved, to a depth of half an inch with *Carpophilus larvae*. The poor preservation of the copra undoubtedly contributes to this state of affairs.

Surface Mulch or Compost

This consists mainly of rotting coconut husks and is used wherever *Alocasia* or *Musa* are cultivated. The invertebrates listed were taken under *Alocasia* plants at Atafu.

1. *Periplaneta* sp.
2. *Subulina octona* (Brug.).
3. *Omphalotropis* sp. near *roseum* (Gould).
4. *Aphanoconia* (*Sphaeroconia*) *musiva* (Gould).
5. *Melanesillo hebridarum* (Verhoeff).

Other Sources

1. *Rhyscotoides parallelus* (Budde-Lund) was picked up on the floor of a Tokelau dwelling.
2. *Camponotus* sp. was taken on board ship between Atafu and Nukunono.
3. A Dolichopodid genus near *Liparomyia* White, occurred on an unidentified plant at Nukunono.

List in Systematic Order with Notes on Distribution:

COLEOPTERA

NITIDULIDAE

Carpophilus maculatus Murr.

This species is distributed throughout the Indo-Australian region, Pacific area including Hawaii, New Guinea, Philippines, Christmas Island, etc., but not Samoa.

Carpophilus dimidiatus (F.)

This species is cosmopolitan. The Samoa records are: Upolu, Tutuila, Manu'a group.

COCCINELLIDAE

Coelophora inaequalis (F.)

This species is widely distributed throughout the Oriental and Australian regions. The Samoa records are: Upolu, Savai'i and Tutuila. Other Pacific records in the British Museum are Hawaiian Islands, New Hebrides, Solomon Islands, Philippine Islands, Lord Howe Island, Loyalty Islands and New Caledonia.

Coccinella repanda Thunb.

This species is widely distributed throughout Asia and Australia. Samoa distribution is: Upolu, Savai'i, Tutuila. Other Pacific records are Tonga and Ellice Islands. Other Pacific records in the British Museum collection are Namoa (Chusan), Lord Howe Island, Cocos Keeling Island, Philippine Islands, Marquesas, Disappointment Island, Austral Islands, New Caledonia, Tahiti, Rapa, Society Islands and Fiji Islands.

CLERIDAE

Necrobia rufipes (Deg.)

This species is cosmopolitan. The Samoa records are: Upolu, Tutuila, Savai'i and Manu'a group.

ANTHICIDAE

Anthicus sp.—not in B.M.

Anthicus oceanicus Laferte occurs in Hawaii, Society Islands, Cocos Keeling, China, Ceylon, Seychelles and Samoa.

LAMIIDAE

Dihammus spp. not in B.M.

Sybra sp. not in B.M.

HYMENOPTERA

FORMICIDAE

Pheidole megacephala Fab. Tropicopolitan.

Camponotus sp.

LEPIDOPTERA

PYRALIDAE

Ephestia cautella Walk. This is a cosmopolitan species.

AGONOXENIDAE

Agonoxena sp. ? *argaula* Meyr. This species is widespread in the Pacific.

DIPTERA

DOLICHOPODIDAE

Chrysosoma sp.

Gen. nr. *Liparomyia* White.

MUSCIDAE

Hardyia sp. nr. *australis* Mall. Not recorded from Samoa.

Musca domestica L. Cosmopolitan.

LAUXANIDAE

Homoneura sp. nr. *pubiseta* Kerr. Not recorded from Samoa.

Homoneura sp. nr. *nudifrons* Mall. Not recorded from Samoa.

Genus occurs Malaya, Australia, Fiji and Samoa.

TRYPETIDAE

Dacus (Chaetodacus) sp. nr. *passiflorae* Frogg. and *Facialis* Coq.

Neither species recorded from Samoa. *D. facialis* recorded from Tonga and New Caledonia. *D. passiflorae* from Fiji.

ORTALIDAE

Scholastes bimaculatus Hendel. Cook Islands, Fiji, Samoa, Ellice Islands and New Hebrides.

CHLOROPIDAE

Cadrema bilineata De Meij. Not recorded from Samoa.

AGROMYZIDAE

Phytomyza apicata Mall. Not recorded from Samoa.

HEMIPTERA

COCCIDAE

Pseudoccus sp.

This species is the same as one collected in Fiji on an undetermined vine. Not yet described.

APHIDIDAE

Pentalonia nigronervosa Coq.

This is a tropicopolitan species.

Aphis (*Cerosipha*) *gossypii* Glover.

This is a cosmopolitan species.

DERBIDAE

Lamenia caliginea Stal.

This species is widely distributed throughout the Pacific area.

Swezeyia sp. probably *maurellei* Muir.

This species is distributed through the Western Pacific.

ORTHOPTERA

BLATTIDAE

Periplaneta sp.

TETTIGONIDAE

Listroscelinae

Gen. et sp. indet.

AMPHIPODA

TALITRIDAE

? Gen. et sp.

MOLLUSCA

Subulina octona (Brug.).

This is a widely dispersed species found on most Pacific Islands, Malagasy, and introduced in hothouses everywhere.

ASSIMINEIDAE

Omphalotropis sp. nr. *roseum* (Gould)

This species was originally described from Fiji; there are specimens in the British Museum from the Ellice Islands.

Helicinidae

Aphanoconia (*Sphaeroconia*) *musiva* (Gould).

This small Helicinid is of a group characteristically developed in the Fiji and neighbouring islands.

ISOPODA

Ligiidae

Ligia (*Megaligia*) *vitiensis* Dana.

This species is widely distributed in the South Pacific. Gambia Islands (Mangareva), Marquesas, Fiji and New Guinea. The species has recently been recorded from Singapore (Purchon and Enoch, 1954). The sub-genus *Megaligia* was erected for the Pacific region, after Verhoeff (1928). *L. vitiensis* Dana, is very close to *L. hawaiiensis* Dana, indigenous to Hawaii.

Rhyscotidae

Rhyscotoides parallelus (Budde-Lund).

This species has been described under a dozen different names because of its very wide distribution. *R. parallelus* most certainly represents a gondwanian species. It is very widely distributed in West Africa (Senegal and Angola) but this is not true of East Africa. It also occurs in tropical America (Antilles, Venezuela, Ecuador). By virtue of its functional hermaphroditism it can be widely dispersed by human agency in the warm regions of the world; islands of the Pacific and Indian oceans, and Indo-China. It has been recorded under the name of *Rhyscotus ortonedae* Budde-Lund by Jackson (1927) at Apia, Western Samoa.

Armadillidae

Melanesillo hebridarium (Verhoeff).

This species has been described from New Hebrides and Banks Island. It has been recovered recently in Tutuila (American Samoa). The genus *Melanesillo* contains two other species, *scamnorum* Verhoeff, from Fiji (Viti Levu) and *bocki* Verhoeff, from the Marshall Islands. The genus *Melanesillo* appears to be close to the genus *Lobodillo* Herold, which contains four species, all indigenous to Bali Island in Indonesia.

In the present state of knowledge of the distribution of fauna in the Pacific it does not seem possible to make any general comment on the occurrence of these insects and other invertebrates in the Tokelau Islands.

The pests of stored products can be accounted for by the previous practice of taking second-hand sacks from Samoa to the Tokelaus for copra. With the exception of the Amphipod which is probably littoral, *Carpophilus maculatus* and *Anthicus* which could have been picked up by the sacks in the ship's hold, and

Ligia vitiensis, they are common pests of stored products in Western Samoa and could be found in most used copra or cocoa sacks.

Of the others, many have a wide distribution in the Pacific which would imply an adequate means of dispersal whether by human agency, drifting debris or wind. Some of the remainder could represent local species but until more is known of the fauna on the island groups adjacent to the Tokelaus (Ellice, Phoenix and Northern Cook groups), no such conclusion seems tenable.

Summary

The paper discusses briefly the localities, host plants and known distribution of a small collection of arthropods and terrestrial molluscs from the Tokelau Islands.

References

Blair, K. G., 1928. Insects of Samoa Part IV, Fasc. 2.

Dumbleton, L. J., 1954. A list of Insect Pests Recorded in South Pacific Territories. South Pacific Commission Technical Paper, 79.

Lever, R. J. A. W., 1946. Insect Pests of Fiji. Department of Agriculture, Fiji Bulletin, No. 23.

Malloch, J. R., 1929–35. Insects of Samoa, Part VI, Fasc. 3, 4, 5, 6, 7 and 9.

Peterson, G. D., 1953. List of Pests of Economic Plants in Guam Submitted to South Pacific Commission (typescript).

A Note on the Occurrence of *Brullea antarctica* Castelnau (Coleoptera: Carabidae) at Otaki Beach

R. M. Bull

575 Featherston Street, Palmerston North.

Unusually large numbers of *Brullea antarctica* Cast. were observed in the sand dunes at Otaki Beach on April 26 and May 24, 1959. From a series of between 24 and 30 beetles found, only one was alive. A great proportion (about 50%) of the beetles found were either completely entangled with the web of a spider or else with the tarsi or entire legs emmeshed.

Five of the beetles observed were in perfect condition while the rest were decomposed and dislocated.

Also in close habitation with *Brullea antarctica* remains were large numbers of the Katipo spider, *Latrodectus hasseltii* Thorell*. Over a hundred specimens were observed within a space of two hours. Only two specimens of other spiders of different species were observed on May 24, and none other than Katipos on April 26.

Driftwood was placed in the dunes to provide cover for the beetles on April 26 as it was completely lacking previously and on re-investigation on May 24, four specimens, one alive, were taken beneath the cover provided. However, within several inches of the dead beetles found beneath the driftwood were one or more Katipo spiders, while none were under the driftwood with the live beetle.

Considerable numbers of this interesting and supposedly uncommon beetle must occur in this locality to survive the obviously heavy onslaught from the Katipo spiders.

* Parrott, A. W., 1948. *Rec. Canterbury (N.Z.) Mus.*, V (3): 161–165.

Distributional and Biological Notes on Sixteen North Island Species of Formicidae (Hymenoptera)

R. A. Cumber

Entomology Division, Department of Scientific and Industrial Research, Palmerston North.

A recent paper by Brown (1958) provides a very necessary stimulus to the furthering of our knowledge of the Formicidae in New Zealand. By comparison with neighbouring countries our fauna is compact and extremely interesting. Brown recognizes some 23 species, of which only 10 are considered to be endemic. An additional Australian species, *Pheidole yarrensis* Forel has been established in the far north for many years. At present, therefore, we can boast no more than two dozen representatives. The writer provided some of the material upon which Brown's account is based, and this named collection together with his keys, and further materials since collected have permitted the present contribution.

Subfamily Ponerinae

Amblyopone australis Erichson

Whangaroa 6.1.57, 1 worker; Waipoua Forest 1.4.49, 1 male; Paihia 12.1.49, 1 worker; 5.3.49, 2 workers, 1 queen, 1 male; Kawakawa 27.2.50, 1 male; 3.3.50, 1 winged queen, 2 males; Paiaka (Manawatu) 15.2.50, 1 winged queen.

Brown indicates that this species also occurs in Australia, New Guinea, New Hebrides, and adjacent islands, and that the "New Zealand population appears to be restricted to the North Island, and centred on the Auckland area." The above records indicate a widespread dispersal in the North Island. Nuptial activities were noted at Kawakawa in early March, 1950, on the gravel edges of a highway which had been built up with rock foundations. This species has nowhere been encountered in large numbers.

Amblyopone saundersi Forel

Pahiatua Track (Palmerston North-Pahiatua) 25.9.56, 10 workers; Waewaepa Range 29.3.57, 1 male.

Brown states that this endemic species is widely distributed in temperate forests of both main Islands. The above workers were taken from a large dry, rotten log in rough grazing country, and the male from among forest litter.

Heteroponera brouni (Forel)

The following records concern only workers.

Oruaiti 22.9.58, 2; Herekino 22.9.58, 1; Kaeo 19.9.58, 1; Peria 23.9.58, 1; Waipoua Forest 26.9.58, 1; Paihia 25.3.49, 1; Tokatoka 3.10.57, 3; Brinderwyn 26.2.59, 9; Maungaturoto 29.9.58, 1; Mangakahia 25.9.58, 3; Pukapuka 18.3.59, 5; Wellsford 18.9.58, 5;

Piha 30.9.58, 3; Clevedon 9.7.58, 8; Tapu Hill, Coromandel, 8.7.58, 1; Kawhia 19.3.59, 2.

Brown suggests that this is an endemic species and probably restricted to the north of the North Island. Kawhia and Coromandel represent the southern-most and Herekino and Oruaiti the northern-most limits in the present material. Arboreal litter, i.e., that which is held up in Nikau, *Astelia* and *Freycinetia*, and the forest floor litter were the sources of the present materials, but further studies are required to determine whether or not nests are to be found in both sites.

Mesoponera castanea (Mayr)

Mangonui 12.2.51, 1 male; Otangaroa 23.2.59, 1 worker; Whangaroa 31.1.53, 1 winged queen; Puketi Forest, 11.2.51, 1 male; Paihia 16.1.49, 1 male; 13.2.49, 1 queen, 1 male; 18.2.49, 2 workers, 1 queen; 3.3.49, 1 worker; 5.3.49, 22 workers, 2 males; 4.2.50, 1 male; Mataraua 15.3.50, 5 workers; Otonga 24.9.58, 8 workers; Wellsford 29.9.58, 2 workers; Ness Valley, Clevedon 9.7.58, 2 workers, 1 queen; Tapu Hill, Coromandel 8.7.58, 3 workers; Te Araroa (J. M. Hoy) 13.8.58, 1 worker; Te Kawa 19.3.59, 3 workers, 2 queens; Waverley 6.10.49, 3 workers; Hicks Bay 11.2.59, 1 worker; Tangoio Hill, Hawke's Bay 9.2.59, 2 workers; Waewaepa Range 29.3.57, 5 workers; Ballance Bridge, Woodville 28.1.59, 1 worker; Foxton 30.4.50, 3 workers, 6 males; Levin 22.4.50, 6 workers; Mangahao 29.1.51, 4 workers.

Brown states that this endemic species which may occupy a wide variety of habitat is "widespread and common in the North Island and also is found around Nelson." The present records confirm his North Island distribution.

Ponera eduardi Forel

Paihia 20.3.49, 2 queens; 23.2.49, 1 queen, 1 male; Tapu Hill, Coromandel 9.7.58, 1 queen; Paiaka, Manawatu 29.12.49, 4 workers; 15.1.50, 30 workers; 25.3.50, 1 worker, 4 males.

Brown records this species, which apparently has been introduced from North Africa, as being of widespread occurrence in the North Island and from Nelson, and as occupying a variety of habitats. The Paiaka material was taken from the sheathing bases of *Phormium* bushes which had died from the "Yellow-leaf" disease, and the Tapu Hill specimens from forest floor litter. Flights in late February and March are common in North Auckland areas and may cause distress to stock. Queens which enter one's clothing may sting very noticeably and bring various reactions.

Subfamily Myrmicinae

Huberia striata (Fr. Smith)

Whakatane 15.2.57, 2 workers; Mt. Egmont 8.11.57, 7 workers.

This endemic species according to Brown is widely distributed in New Zealand. The above specimens were taken in forest floor litter.

Huberia brouni Forel

Paihia 23.2.49, 1 male; Te Araroa (J. M. Hoy) 13.8.58, 1 worker; Haurangi Range 24.1.59, 2 workers.

Brown records this endemic species as being widely distributed in the North and South Islands.

Tetramorium grassii Emery

Paihia 5.3.49, 1 winged queen.

Brown records this South African species from the vicinity of Auckland.

Monomorium antarcticum (White)

Te Kao 7.3.50, 2 workers, 1 winged queen, 1 male; Oruaiti 22.9.58, 2 workers; Mangonui 12.2.51, 5 workers, 8 males; Kaeo 25.2.49, 24 workers; Whangaroa 31.1.53, 2 workers; Puketi Forest 11.2.51, 1 worker; Okaihau 5.3.50, 9 workers; Paihia 16.2.49, 9 workers; 18.2.49, 10 workers, 1 winged queen, 1 male; 5.3.49, 2 workers, 2 winged queens, 1 male; 14.3.49, 7 workers; 4.3.50, 3 workers, 3 winged queens, 3 males; Kaikohe 1.4.49, 6 workers, 8 winged queens, 7 males; Waimatenui 15.3.50, 3 workers, 3 winged queens, 3 males; Wellsford 12.3.51, 3 workers; Te Aroha 7.7.58, 1 worker; Chateau Road, Ruapehu, 27.3.58, 1 worker; Waverley 6.10.49, 36 workers; Mangahao 7.10.49, 17 workers, 1 queen; 6.1.50, 2 queens; Foxton 7.1.50, 11 workers, 3 winged queens; 15.1.51, 21 workers; 30.1.51, 1 worker; Paiaka, Manawatu 16.1.50, 2 workers; 15.2.50, 1 male; 1.5.52, 6 workers, 2 males; Levin 27.4.50, 9 workers.

According to Brown "The *Monomorium antarcticum* complex includes what are probably the commonest and most ubiquitous of New Zealand ants. They are also the most variable. . ." The present records of this endemic species substantiate Brown's remarks in respect of the North Island. The paler northern forms are well represented. The nests occupy a wide variety of habitats.

Monomorium smithi Forel

Paihia 18.2.49, 8 workers, 2 queens.

This apparently endemic species is of widespread occurrence in both Islands. The above specimens were taken from a nest located in a small cavity beneath the bark of a dry *Leptospermum* trunk.

Orectognathus antennatus Fr. Smith

Peria 23.9.58, 10 workers; Ahipara-Herekino Saddle 22.9.58, 2 workers.

Brown states, "It seems very likely that *O. antennatus* was originally introduced by man into New Zealand from New South Wales. Even now, the species is very restricted in distribution having been found only in and around Auckland. In Australia *antennatus* is found only in wet forest in Victoria and New South Wales, where nests have been found in and under rotten logs." The above specimens were taken from mixed forest floor litter, and litter held up in plants, etc. At Peria the species was taken by beating large *Freycinetia* clumps which had recently been dislodged to lie on the forest floor. The present known range of this species in New Zealand is thus considerably extended.

Strumigenys perplexa (Fr. Smith)

Paihia 18.2.49, 9 workers; Mitimiti 1.10.57, 8 workers.

According to Brown, "This species has been taken at a number of places widely scattered over the North Island. . . ." It also occurs in varying woodland types in Australia and Tasmania, and in Lord Howe and Norfolk Islands. He suspects its introduction from Australia within historical times.

Pheidole yarrensis Forel

Paihia 25.1.49, 4 soldier and 4 small workers.

Brown identified this species in the material forwarded to him, but appears to have overlooked it in his subsequent account of the New Zealand ants. I recall seeing this distinctive Australian species at Kaikohe at least 25 years ago. Further specimens were taken recently during pasture studies at Whangaroa (Cumber, 1959b).

Subfamily Dolichoderinae

Iridomyrmex glaber (Mayr)

Spirits Bay 13.2.51, 1 winged queen; Kaeo 13.3.50, 3 workers; Paihia 18.2.49, 3 workers; 20.3.49, 7 workers; 25.2.50, 8 queens; 28.2.50, 3 queens; Okaihau 5.3.50, 8 workers; Mt. Messenger 30.11.48, 1 worker.

Brown records this species which is probably an introduction from Eastern Australia, from the vicinity of Auckland stating that no samples had been received from any "wild areas of country". The above records extend his range considerably. Nests were observed under stones and in rotting wood.

Technomyrmex albipes (Fr. Smith)

Paihia 28.2.49, 5 workers.

This species occurs in South-East Asia and the Pacific, and is thought to have been introduced into New Zealand in historical times. It is still largely confined to urban areas in the North Island and about Nelson in the South Island. It is a household pest of considerable importance in northern areas—especially coastal ones —where its invading columns with their rancid attending odour

are frequently encountered. Nests occur in masonry and joinery, plywood doors being commonly occupied when access is available through hinge-holes or badly joined ends.

Subfamily Formicinae

Prolasius advena (Fr. Smith)

Spirits Bay 13.2.51, 8 workers; 13.1.57, 4 workers; Waiare 19.9.58, 9 workers; Mangonui 8.3.50, 2 workers; Peria 23.9.58, 1 worker; Waimatenui 15.3.50, 4 workers; Paihia 5.3.49, 1 winged queen; Okaihau 5.3.50, 9 workers; Motukaraka 1.10.57, 8 workers, 1 queen; Mitimiti 1.10.57, 1 worker; Silverdale 18.9.58, 1 worker; Clevedon 9.7.58, 1 queen; Waioeka Gorge 13.2.57, 3 workers, 1 queen; Eketahuna 24.1.59, 5 workers.

This endemic species which is of widespread occurrence in both North and South Islands is found primarily in bush country. It occurs commonly in the litter beaten from Nikau, *Astelia* and *Freycinetia*.

The present account does not attempt to define the boundaries of the North Island species. It seemed desirable however, to place on record information on materials which the writer has accumulated by casual collections in odd North Island districts during the past ten years. Further records obtained during studies of North Island grassland areas are being recorded in pasture survey papers (Cumber, 1959a, b).

The northern areas are profitable ones in studying the Formicidae. Early Bay of Islands shipping is doubtless responsible for many of the introductions.

References

Brown, W. L., Jr., 1958. A Review of the Ants of New Zealand (Hymenoptera). *Acta Hymenopterologica I* (*1*): 1–50.

Cumber, R. A., 1959a. The Insect Complex of Sown Pastures in the North Island. V. The Hymenoptera as Revealed by Summer Sweep-Sampling. *N.Z.J. agric. Res. II*. 874–897.

———— 1959b. The Insect Complex of Sown Pastures in the North Island. X. Insects Revealed in Studies of Soil, Turf, and Dung. *Ibid*. In press.

Attack by *Calotermes brouni* Frogg. on Living *Pinus radiata*

R. Zondag
Forest Research Institute, Rotorua.

Synopsis

Calotermes brouni Frogg., the New Zealand dry-wood termite, attacks living overmature *Pinus radiata* trees in farm woodlots and shelter belts. Infestation starts in dead branches and snags and may continue into the heartwood. Most severely attacked trees are unsuitable for conversion to sawn timber. Unhygienic conditions and lack of silvicultural attention tend to enhance the danger of attack in overmature stands. No infestation by this species or by introduced Australian termites has been reported from any of the large exotic plantations.

Two species of termites, *Calotermes brouni* Frogg. and *Stolotermes ruficeps* Brauer are native to New Zealand, while a few species of Australian termites are established in the country. *C. brouni* is called the New Zealand dry-wood termite because of its ability to attack and form colonies in seasoned timber. For this reason it is sometimes troublesome in buildings. *C. brouni* may also inhabit wet timber, but *S. ruficeps*, the New Zealand wet-wood termite, breeds almost exclusively in wet wood. Both species are not uncommonly found in the native forest inhabiting dead logs and stumps.

During the last three years a few instances of attack by *C. brouni* on living *Pinus radiata* trees have been brought to my attention.

In September, 1956, three farm woodlots in the Gisborne district were examined in which termite infestation had been reported. The trees varied in age from 35 to 50 years and infestations of the heartwood of living trees were found. The degree of the infestation varied in the three woodlots and in the individual trees. Infested trees showed that the initial attack occurred in dead branches and snags. In many cases the infestation continued into the heartwood, in which separate colonies could be found. Snags and large dead branches were found to be more favourable for attack than branches smaller than one inch in diameter. The galleries in the heartwood extended from knot holes on both sides of the whorls. In some trees the infestations were found to a height of 63 feet above the ground. Green branches started at the next whorl. In other trees infestation occurred at irregular intervals due to the greater number of dead branches and snags of small size.

In two stands approximately 45 years of age the condition of the timber was such that conversion to sawn timber would have been uneconomical. Although intensive examination of the wood below the dead branches and snags had been undertaken before transport to the sawmill, in many cases infestation was not revealed until the timber was sawn, and severe docking was necessary to save some of the timber. The infestation by *C. brouni* was not of recent occurrence and may have started ten or even fifteen years previously.

In the third stand, which was approximately 35 years old and consisted of a mixture of *Pinus radiata, P. nigra,* and *Pseudotsuga taxifolia,* only the first-mentioned species was found to be attacked. The infestation appeared not so severe as in the two previous stands and in most cases was confined to dead branches in the lower whorls; here the tunnels did not extend more than one inch into the trunk. These trees could probably still be converted into sawn timber as the infested parts would be removed in the slabs.

The three woodlots examined were all surrounded by farm land and were rather far removed from any native forest. In all three, *C. brouni* was found in dead trees and in logs on the ground and in stumps. In two of them *Eucalyptus* stumps were severely infested.

From the Levin area a similar infestation on living *P. radiata* trees in a shelter belt was reported in 1957.

In October, 1958, samples from *P. radiata* trees over 50 years of age from a shelter belt at Matakana (North Auckland) were received showing infestation of the heartwood. Most of these logs were, according to the sawmiller, unsuitable for conversion.

The infestation of farm woodlots and shelter belts may prove an object lesson illustrating the need for early appropriate silvicultural attention in those stands, and for hygienic conditions under the trees. Unhygienic conditions in and under farm woodlots and shelter belts provide breeding material for the termites and so render the living trees more susceptible to attack, especially when pruning of dead branches and snags from the trees is not undertaken as the stands become mature. It is assumed that under such conditions the infestation starts in the dead trees, in logs on the ground, or in stumps. The emerging adults of the new generation start new colonies on dead timber. After several generations the dead material will be all occupied by colonies and attack will start on the dead branches and snags of the living trees. When these colonies grow the only possibility of extending the tunnels is into the living tree. Further generations have no choice but to found new colonies in other dead branches and snags of the living trees.

No infestation of live *P. radiata* trees by *C. brouni* or by any of the introduced Australian subterranean or dry-wood termites has been reported from the large exotic plantations in New Zealand.

Attack by *C. brouni* in mature *Cupressus macrocarpa* in shelter belts is of common occurrence.

Stolotermes ruficeps, the native wet-wood termite, is not uncommonly found breeding in dead *P. radiata* and other exotic conifers in large plantations.

The Australian Ant *Iridomyrmex darwinianus* (Forel) Recorded from New Zealand

R. W. Taylor
Zoology Department, University of Auckland

In April, 1959, the Auckland City Council termite inspectors, Messrs. G. Cronin and A. Graham called the attention of the author to a timber yard at Penrose, near Auckland, where a number of unusual ants had been observed. On investigation of the area several exotic ant species were collected, including the Australian *Iridomyrmex darwinianus* (Forel), hitherto unrecorded from New Zealand.

It was found that the distribution of this ant was almost entirely restricted to the area of a partly buried loose stone dividing wall, about 2ft high, 4ft wide, and 100ft long. Throughout this area, under the stones of the wall, an enormous, almost continuous population of the ants was located. Scattered throughout the population were numerous dealate queens, and brood clusters.

The wall therefore contained a nest continuum similar to that seen in the colonies of the notorious "Argentine Ant", *Iridomyrmex humilis* (Mayr) (Wheeler, 1927, Clark, 1941), which species *darwinianus* does in fact resemble (Clark, 1941).

Numerous portions of arthropod exoskeleton found in the nest would suggest that the species is a carnivorous feeder. However, a small group of workers was located tending root-feeding homoptera; and in the laboratory, sugar and honey were eagerly accepted.

It seems certain that this species could readily invade buildings, and there is little doubt that due to its highly prolific nature it is one of the most undesirable potential pests in the country.

At the time of collection, specimens were identified by the author as *Iridomyrmex* sp., and considering the major pest importance of this genus (Brown, 1958), the obvious fecundity of the species, and its close similarity both in structure and behaviour to *I. humilis*, the Department of Agriculture was notified, and the infestation exterminated.

Specific indentification has since been given by Dr. W. L. Brown, Jnr., of Harvard, who has commented (*in litt.*) that this species occurs in south-east Australia, where it nests inconspicuously in small colonies, usually under stones in open country.

It would appear that there is some parallel between the development, in *darwinianus*, of modified nesting behaviour in New Zea-

land; and the similar behaviour of *humilis* in areas to which it has been introduced from Argentina, where it seems to be of only minor dominance in the ant fauna.

It is hoped that this note will correct the prevalent misconceptions regarding the identification of this species, which was reported widely in the press as being the "Argentine Ant", when in fact *I. humilis* is not known to be present in New Zealand.

References

Brown, W. L., Jnr., 1958. A review of the ants of New Zealand (Hymenoptera). *Acta Hym., Fukuoka,* 1; 1–50.

Clark, J., 1941. Notes on the Argentine Ant and other exotic ants introduced into Australia. *Mem. Nat. Mus. Victoria, Melbourne,* 12; 59–70

Wheeler, W. M., 1927. The ants of the Canary Islands. *Proc. Amer. Acad. Arts Sci., Boston,* 62; 93–120.

A Note on the Status of the Ant Species *Monomorium* (*Notomyrmex*) *smithii* Forel— (Hymenoptera: Formicidae)

R. W. Taylor
Zoology Department, University of Auckland

In his review of the ants of New Zealand, Brown (1958) has shown that the specific constitution of the subgenus *Monomorium* (*Notomyrmex*) in this country cannot be properly evaluated with available material. This is due to the high degree of apparently intergradient variation shown by his *M. antarcticum* species complex, in which he was not able to draw satisfactory species limits, although the complex probably contains several species whose recognition is confused through the workings of Character Displacement (Brown, *loc. cit.*).

Of the six native species of *Monomorium* described prior to 1958 Brown placed all but one as full or provisional synonyms of *M. antarcticum* (White), thus constituting the *antarcticum* complex. The sixth named form, *M. smithii* Forel, was tentatively placed as a second good species in his scheme.

It is now possible to verify the specific status of *M. smithii* due to the present record of its sympatry with *M. antarcticum*, on Rangitoto Island, in the Hauraki Gulf near Auckland.

In August, 1957, the author collected nine colonies of *Monomorium* from beneath stones embedded in heavy leaf litter and residual soil, east of the well, at about 650ft altitude, on the south side of the island.

Five of these colonies proved to be of typical *M. smithii*, while the remainder belonged to the *M. antarcticum* variant referred to as "typical" by Brown (*loc. cit.*, p. 30). Careful examination of the material has yielded no evidence that intergrades may be produced by hybridisation of these two forms, indicating that sexual isolation between them is probably complete, and verifying their separate specific status as suggested by Brown.

The nine colonies were all taken in an area of about 750sq ft, over which they were irregularly scattered, giving no indication of significant ecological differences in the ranges of the two species. The area was damp and heavily shaded, and is known to be one of the largest continuous areas of soil developed on Rangitoto. Judging from the few records available, this niche would seem to provide a fairly typical habitat for *M. smithii*, which is most commonly taken in Berlese funnel samples of moist forest litter.

M. antarcticum, however, seems to have been occupying a marginal habitat, as this species is normally found nesting under stones in open, fairly dry, grassland areas.

It is probable the two species have been forced into sympatry due to the general shortage of suitable niches for either, on the arid scoria and basalt cone of Rangitoto, where the only soil cover consists of usually very small residual pockets.

Other ants associated with these two species included *Amblyopone australis* Erichson, *Strumigenys perplexa* (Fr. Smith), and *Prolasius advena* (Fr. Smith).

I have to thank Dr. W. L. Brown, Jnr., of Harvard, for checking the identification of the species discussed.

Reference

Brown, W. L., Jnr., 1958. A review of the ants of New Zealand (Hymenoptera). *Acta Hym., Fukuoka,* 1 (1): 1–50.

Insects on Citrus

K. A. J. Wise
Plant Diseases Division, Department of Scientific and Industrial Research

During a survey of Tortricid leaf-rollers on citrus (*Citrus* spp.), carried out in the Auckland area from November, 1955, to May, 1957, it was found that other insects commonly inhabited leaf-rolls. These are recorded together with some interesting species not found in leaf-rolls.

Tiny insects, mainly psocids, Collembola, and small beetles, were often numerous in leaf-rolls and were sometimes found living with the leaf-roller caterpillars. Except in the general case, where other insects followed the caterpillars, no evidence of succession could be found in the leaf-roll fauna.

COLLEMBOLA

Family Entomobryidae

Entomobrya nivalis (De Geer) (Det. J. T. Salmon)

Occurred commonly in leaf-rolls from early summer to late autumn being most abundant in March and April. This appears to be the first record of this habitat for the species.

PSOCOPTERA

Family Caecilidae

Caecilius flavistigma Till.

A few in leaf-rolls and on open leaves in January and April.

Ectopsocus congener Till.

In leaf-rolls, a few in December, very common by late summer (March).

Both these species were recorded by Tillyard (1923) as being common in native bush and in orchards, and by Rawlings (1953) as being common on *Pinus radiata*.

ORTHOPTERA

Family Stenopelmatidae

Hemideina thoracica figurata Walk. (Det. A. M. Richards).

One nymph of this weta was found in a leaf-roll in January.

HEMIPTERA

Family Lygaeidae

Pachybrachius nigriceps (Dallas) (Det. T. E. Woodward).

One was found in a leaf-roll in April. A chance occurrence, the species being common on grasses.

Family Pseudococcidae

Pseudococcus sp.

Mealybugs were common in leaf-rolls throughout the summer and autumn, from December to May.

THYSANOPTERA

Family Thripidae

Parthenothrips dracaenae (Heeger)

Thrips were rarely found in leaf-rolls. This species is represented by one female taken from a leaf-roll in February. It has not previously been recorded on citrus.

Family Phlaeothripidae

Nesothrips propinquus breviceps Bagn.

Females were taken from leaf-rolls in March and April.

Lepidoptera

Family Geometridae

Selidosema suavis (Butl.)

Two moths were bred from larvae taken in November, 1955, and December, 1956. This is the first record of the species on citrus.

Selidosema dejectaria (Walk.)

Two moths were bred from larvae taken in December, 1956. This is the first record of the species on citrus.

In December, 1956, seven looper caterpillars were found on citrus leaves and from these three of the moths recorded above were reared. Another looper was taken in April, 1957, but was not reared. As far as is known no Geometrid species have previously been recorded from citrus in New Zealand.

Family Heliodinidae

Stathmopoda phlegyra Meyr.

From time to time small brown caterpillars have been found in debris webbed to leaves, in dead small fruit, and in dead blossoms, on citrus trees. From two of these larvae, collected in November, 1956, moths emerged in January, 1957. In addition three larvae were collected from leaf-rolls in April, 1957. The species has not previously been recorded from citrus.

COLEOPTERA

Family Cryptophagidae

Micrambina helmsi Reitt. (Det. E. S. Gourlay).

Cryptophagids of three species were common in leaf-rolls throughout the summer. *M. helmsi* was the only one identified and is possibly the most common. Mr. Gourlay advised (*in pers. comm.*) that this species is widespread throughout New Zealand and may sometimes be found in large numbers on gorse flowers.

Family Lathriidae

Melanophthalma gibbosa Herbst. (Det. D. Spiller).

Very common in leaf-rolls throughout the summer. It is a common scavenger.

Family Coccinellidae

Orcus chalybeus Boisd.

Larvae were occasionally found in leaf-rolls where they would probably be predatory on some of the other insects recorded here.

A larva was also seen, on an open leaf on a tree, feeding on a batch of Noctuid moth eggs.

Rhizobius ventralis Er. (Det. D. Spiller).

One adult was found in a leaf-roll in December, 1956.

Family Curculionidae

Pantomorus godmani (Crotch)

Adults were common in leaf-rolls from March to May.

Leptops squalidus Boh.

Several specimens of this large Australian weevil were taken while eating foliage of Washington Naval Orange (*Citrus sinensis* Osbeck.) in Kerikeri in January, 1956. Specimens, in the Plant Diseases Division collection, have been taken at Kerikeri from time to time since 1945.

Acknowledgments

Dr. J. T. Salmon, Victoria University, Wellington, Dr. T. E. Woodward, University of Queensland, Australia, Mr. E. S. Gourlay, Entomology Division, Nelson, Dr. Aola M. Richards and Dr. D. Spiller, Plant Diseases Division, have kindly identified some of the insects recorded here.

References

Rawlings, G. B., 1953. Insects of *Pinus radiata* Forests in New Zealand. *N.Z. Forest Research Notes,* 1 (8): 1–19.

Tillyard, R. J., 1923. A Monograph of the Psocoptera, or Copeognatha, of New Zealand. *Trans. N.Z. Inst.*, 54: 170–196.

A Record of Sound Produced by the Larvae of *Tetrorea cilipes* White (Coleoptera: Cerambycidae)

J. I. Townsend

Entomology Division, Department of Scientific and Industrial Research, Nelson.

Night collecting was being carried out in native bush at Greenhills near Bluff on January 18, 1959, when a pronounced clicking noise was heard. It was a warm moonlight night with intermittent moderately strong gusts of wind and calm periods. The time was about 12.30 a.m. The particular area had been passed earlier that evening, when no noise was heard, although on that occasion it could have been undetected due to the squally conditions.

The sound was a very regular clacking noise similar to that produced intermittently by our large cicada, *Melampsalta cingulata* Fabricius, although not as loud. The source was traced to a recently killed putaputaweta tree or marble leaf, *Carpodetus serratus* Forst. about twenty yards distant. This tree was lying horizontally, resting on its upper branches, with dry leaves still attached to the twigs. There were no insects visible and the noises were found to be coming from within the branches. One sound was traced to a particular branch, a section of which was removed for further study.

Sound seemed to emanate from between 25 and 50 different sources in the tree, although an accurate count was impossible. The main concentration was in the smaller branches of 1–3 inches diameter. Response to outside disturbance such as sound or vibration was immediate, any movement causing an abrupt cessation of clicking. After a quiet period of perhaps up to a minute the clicking sounds would recommence, firstly from a single source. If at this stage there was no support from others, due to some local disturbance factor, the initial source would also become silent.

On returning to Nelson a fortnight later and by isolating the various insects found within the sample, it was discovered that the noise was caused by cerambycid larvae. These were determined as *Tetrorea cilipes* White, by using Dumbleton's keys (1957) and later confirmed by the rearing of adults. From the sample section which was $1\frac{3}{4}$ inches in average diameter and 18 inches long a total of 4 adults, 3 pupae and 7 larvae was obtained.

Other insects in the sample were *Aphocoelis versicolor* Broun, *Psepholax simplex* Pascoe, and *Stephanorhynchus curvipes* White. Many specimens of *Paranomocerus spiculus* Redtenbacher were found in pupation cells in the wood immediately below the bark

layer, and under the bark itself were *Eiratus suavis* Broun and numerous specimens of *Dendrotrupes vestitus* Broun.

Under laboratory conditions the duration of the clicking sounds was markedly different from that noticed in the field. The periods of activity lasted for only a minute or much less at a time, whereas in the natural habitat sound production was continuous unless the insects were disturbed. It is probable that insufficient larvae were present in the sample to provide the group stimulus apparently necessary for the continuous production of sound.

For a week the sample was kept under as constant observation as posible and during that period sounds were heard between darkness and midnight on four occasions, 17 times during the midnight to dawn period and three times during daylight. A tape recording was made of typical clicking sounds.

The method of sound production was not positively determined, although it seems unlikely that it is made by any structural mechanism in or on the insect itself. It was found that the larvae were just beneath the thin layer of bark when making the noise. On one occasion the bark was seen to pulsate simultaneously with sound production, as though a larva had grasped a fragment on the underside with its mandibles, and the sound occurred when this was torn free. The localised area of bark would thus act as a tympanum and amplify the sound. On removing all the bark only scarcely audible clicking sounds were heard from within the wood. Crawshay (1907) states that clicking sounds similar to those described are produced by the larvae of *Tetropium gabrieli* Weise, European cerambycid, "For some time prior to, and especially during the excavation of the pupa—cavities in the bark." This seems a feasible explanation for the behaviour of *Tetrorea cilipes* larvae. Sound would depend not only on the presence of the insects, but also on the type and condition of the bark of the host tree. A prolonged soaking by rain possibly could soften the bark to such an extent as to completely prevent sound production. Prior to collecting material at Greenhills, there had been a long dry priod. In America, Chittenden (1896) has noted clicking sounds associated with the larvae of *Leiopus cinereus* LeConte and also with the pupae of *Leptostylus biurstus* LeConte, both of which are cerambycids.

This appears to be the first record of sound produced by the immature stages of the New Zealand Cerambycidae, although many adults of this family are well known as being capable of loud stridulation.

Acknowledgment

The author gratefully acknowledges the help of Mr. E. S. Gourlay for the identification of *Eiratus suavis* Broun and Mr. R. Zondag for the identification of *Dendrotrupes vestitus* Broun.

References

Chittenden, F. H., 1896. On the habits of some longicorns. *Proc. ent. Soc. Wash.*, 3: 95–102.

Crawshay, G. A., 1907. The life of *Tetropium gabrieli*, Ws.=*T. fuscum*, Sharp=*T. crawshayi*, Sharp, etc. *Trans. R. ent. Soc. Lond.*, 1907: 183–213.

Dumbleton, L. J., 1957. The immature stages of some New Zealand longhorn beetles (Coleoptera-Cerambycidae) *Trans. R. Soc. N.Z.* 84: 611–628.

The Occurrence of the Family Mesoveliidae in New Zealand (Hemiptera, Heteroptera)

J. G. Pendergrast
University of Auckland.

The family Mesoveliidae has not so far been recorded from New Zealand.

While making Tullgren funnel extractions of Peloridiidae from moss collected from Mt. Moehau, Coromandel Peninsula, on 22/3/58, I found insects having the typical gerroidean habit of moving about on the surface film of the water in the collecting jars. These insects proved to be apterous Mesoveliidae.

The discovery is of interest in that while the typical habitat for members of this family is on the surface of ponds and on leaves of floating plants, these insects were living in moss on the trunks of trees at an altitude of about 2,700ft and at a great distance from ponds or streams. It would seem that they live under the same conditions as the Peloridiidae, i.e., in moss which is kept wet by rain or mountain mist. I have since found them in wet moss from the highest point (1,580ft) and Ruaotuwhenua (1,442ft) in the Waitakere Ranges, Auckland.

The presence of Mesoveliidae at this altitude and away from bodies of water was surprising considering the fact of the absence of "normal" members of the family in New Zealand. It is, therefore, of interest that Dr. T. E. Woodward, University of Queensland, tells me that recently he has found "normal" Mesoveliidae in the collection of Dr. R. A. Cumber, Palmerston North. Dr. Cumber has informed me that they were collected on 14/3/50 from among rushes and water-weeds at the side of a pond at Punakitere, near Kaikohe, North Auckland.

Mesoveliidae seem to have a tendency to leave the water surface and live among vegetation. *Mesovelia furcata* Mulsant and Rey, the British species, spends much of the time on floating leaves of pond plants and Grassé's *Traité de Zoologie* notes that Mesoveliidae can run on floating leaves but cannot climb erect stems. Imm's *General Textbook of Entomology* (revised Richards and Davies), states that *Phrynovelia papua* of New Guinea is terrestrial, living among fallen leaves in forests.

I wish to express my thanks to Dr. Woodward for informing me of the specimens in Dr. Cumber's collection, and to Dr. Cumber for permission to make reference to them in this note. I hope that Dr. Woodward will describe these moss-inhabiting Mesoveliidae in the course of his revision of the New Zealand Heteroptera.

Notes on the Ecology of Some Cicadas in the Wellington District

G. W. Ramsay
Wellington

This note is based on two sets of observations, one made at Cape Palliser in January, 1954, in the area below the lighthouse, and the other at Kelburn Park, Wellington, during February and March, 1958. The five species involved were recognised by the stridulation of the males, and all showed distinct habitat preferences.

Two large species, *Melampsalta cingulata* (Fabr.) and *Melampsalta strepitans* (Kirk), were common at Cape Palliser, the former in patches of scrub (consisting mostly of *Cassinia* sp.), and the latter in open areas, usually being found settled on stones, fence-posts, or other suitable objects in the shingle of a stream bed, or on bare rock surfaces among the sparse vegetation on the coastal cliffs. These habitat preferences were most marked where an open stream bed was surrounded by scrub, *M. strepitans* being present only on the open bed and *M. cingulata* in the scrub on either side. In the Lower Wairarapa area the predilection of *M. cingulata* for trees was also very conspicuous for it occurred in great numbers, and produced an almost deafening sound, in scattered eucalypt and macrocarpa plantations but was absent from the surrounding countryside. Myers (1929a) mentions similar habitat preferences for these species. The stridulation of *M. cingulata* and *M. strepitans* has been described a number of times (Hudson, 1950; Myers, 1921 and 1929a; Myers and Myers, 1924) and provides a good means of identification, the sound produced by *M. cingulata* being continuous and slightly varied while that of *M. strepitans* is erratic and more monotonous.

Cicadas were particularly abundant at Kelburn Park, Wellington, during the autumn of 1958, four species, *Melampsalta cingulata*, *M. ochrina* (Walk.), *M. muta* (Fabr.) and *M. cauta* (Myers) being present. A fifth species probably occurred also, but as no specimens were captured it could not be identified. As its stridulation and habitat preference were similar to those of *M. cauta* it is included with that species for the purpose of this note.

During February, when the weather was warm, these species occurred in different, separate habitats, but later in the season, as the weather became cooler, a certain amount of overlapping occurred, especially between *M. muta* and *M. ochrina*. *Melampsalta cingulata*, which was very common, preferred the upper

sunny branches of trees, lamp-posts, and other sufficiently high objects; the smaller, vivid green species, *M. ochrina,* also common, was found mostly on shrubs or the lower branches of trees at the edges of plantations; *M. muta,* a small, widely distributed species, was not common and when present occurred only in open grassy areas; *M. cauta,* also relatively scarce, was only heard in the cool shady depths of the plantations, but later in the season moved toward the edges. The stridulation of these species is distinct and has been described a number of times before (see previous references). The stridulation of *M. ochrina* consists of a steady, shrill, penetrating sound, reminiscent of a chaff-cutter, and that of *M. cauta,* a slow, rather quiet, monotonous sound. *M. muta,* a variable species, produces an extended sound followed by three or four short staccato sounds, the whole being repeated over and over again. The high degree of specificity of cicada song, recently confirmed by a physiological analysis (Pringle, 1954), has long been known (Myers, 1929b). These four species are therefore living in partial isolation at Kelburn Park. Similar habitat preferences are recorded for them by Hudson (1950) and Myers (1929a) but I can find no previous record of the four species occurring in partial isolation at the one locality although this must commonly occur.

References

Hudson, G. V., 1950. Fragments of New Zealand Entomology. Wellington, Ferguson and Osborne, Ltd., 188 pp.

Myers, J. G., 1921. *Trans. N.Z. Inst.,* LIII: 238–250.

Myers, J. G., 1929a. *Trans. Ent. Soc. Lond.,* LXXVII (I): 29–60.

Myers, J. G., 1929b. Insect Singers. London, G. Routledge and Sons, XIX, 304 pp.

Myers, J. G., and Myers, I., 1924. Rept. 16th Meeting Aust. Assoc. Adv. Sci.: 420–430.

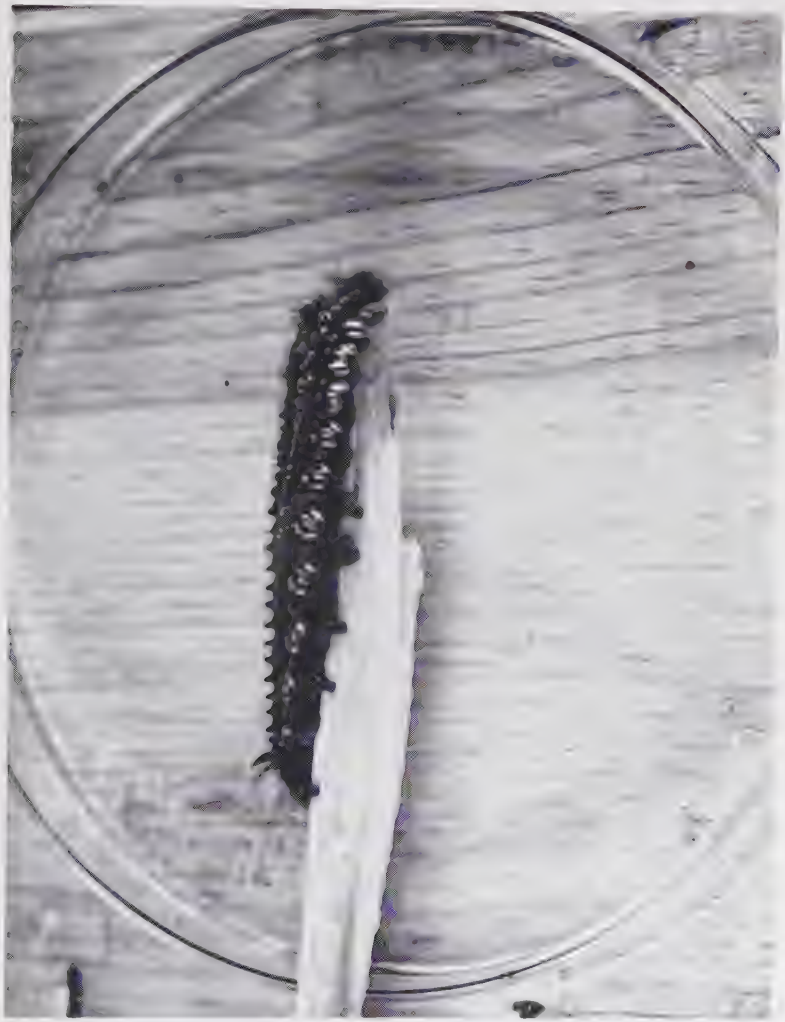
Pringle, J. W. S., 1954. *Journ. Exp. Biol.,* XXXI (4): 525–560.

An Insect and a Mite New to New Zealand

D. C. M. Manson
Department of Agriculture, Wellington

The Drinker Moth *Philudoria potatoria* L. (Lasiocampidae)

On February 7, 1957, I received a caterpillar of this moth from Mr. T. N. Flint of Palmerston North. The insect was found on



Larva of *Philudoria potatoria* L.

Hydrangea plants from Holland, and sent to Wellington for identification.

On arrival, it was alive, but not very active, and showed no inclination to feed on *Hydrangea,* or a variety of other plants which were made available. However, the caterpillar immediately drank several drops of water which were placed inside the cage. Subsequently, it chose to eat cocksfoot (*Dactylis glomerata* L.).

The caterpillar moulted on February 10, 1957. Two further moults took place on February 22, 1957 and March 2, 1957. When full grown the caterpillar was eating from ten to fourteen, six-inch blades of cocksfoot per day. Its final length was $2\frac{3}{4}$ inches, as compared with a length of less than one inch when first received.

The cocoon was spun overnight on March 19, 1957, and attached to the side of the cardboard container. It is boat shaped, $2\frac{1}{4}$ inches long, yellowish, and decorated with hairs from the caterpillar's body.

The adult emerged on April 8, 1957. It is yellowish, with a wingspan of $2\frac{1}{2}$ inches. *Philudoria potatoria* L. is widespread in Europe and Britain, where it apparently feeds on coarse grasses. A characteristic of the caterpillar is its partiality for a drop of water, from which it gets its common name, "The Drinker".

Reference

South, R., 1939. Moths of the British Isles, Series I; 123.

Camellia rust mite—*Calacarus carinatus* (Greene) (Eriophyidae)

This is believed to be the first record of this eriophyid mite in New Zealand.

Mr. J. D. Overbye of Gisborne forwarded leaves of *Camellia* plants in April, 1958. On the under surface of the leaves were corky brown spots, while a closer examination revealed numbers of purplish coloured mites and white, waxy shed skins.

Further specimens of *Camellia* plants were received from surrounding districts in the Gisborne area, and in many cases mites were present, as well as the typical symptoms of the damage they cause. It would seem that the mite is more widespread than was at first thought.

Specimens of the mite were forwarded to Mr. H. H. Keifer of the Department of Agriculture, California, for confirmation. It is described by Keifer (1952) under the synonym *Calacarus adornatus* (K.).

The camellia rust mite is also commonly known as the ribbed tea mite or purple mite. It attacks *Camellia* (mainly *Camellia japonica* L.) and tea plants (*Thea sinensis* L.) and Keifer states that "apparently tea and camellia trade mites indiscriminately".

Reference

Keifer, H. H., 1952. The Eriophyid mites of California, *Bull. Cal. Insect Survey* 2, 1: 41.

A Record of *Xenophyes cascus* Bergroth (Homoptera: Coleorrhyncha) from the Waewaepa Range

R. A. Cumber

Entomology Division, Department of Scientific and Industrial Research, Palmerston North.

While making general collections of insects in the dwindling bush remnants on the Waewaepa Range on 29.3.57, two adults (male and female) of the above-named peloridiid were taken. They were recovered from mossy materials growing on a large fallen tree trunk in marginal bush at about 1,500 feet. *M. cascus* is the most widely distributed species of this interesting group in New Zealand (Woodward, 1956, 1958).

The Waewaepa Range appears as a northern continuation of the more southern Haurangi Mountains, both being to the east of, and separated from the roughly parallel Tararua Range of the main axial chain by the relatively low-lying country which is now bare of forest. Only small remnants of the original forest of the Waewaepa Range now exist and it is highly desirable that the fauna of this excellent collecting area be sampled before it is gone.

I am indebted to Dr. Woodward for verifying the identity of the species.

References

Woodward, T. E., 1956. On Australian and New Zealand Peloridiidae (Homoptera: Coleorrhyncha). *Univ. Queens. Papers, Dep. Ent. 1 (3)*: 31–56.

———— 1958. A New Species of Peloridiidae (Homoptera: Coleorrhyncha) with a Key to the New Zealand Species. *Trans. Roy. Soc. N.Z. 84 (4)*: 687–693.

AVAILABLE FROM STOCK..

Low Power and High Power
Stereoscopic Microscopes, Pins
Magnifiers, Dissecting
Instruments, etc.,

FOR THE ENTOMOLOGIST

GEO. W. WILTON & CO. LTD.

G.P.O. Box 367, WELLINGTON.
G.P.O. Box 1980, AUCKLAND.

In the
Service of Science . . .

ILFORD
LIMITED, LONDON.

have produced photographic materials for a wide range of specialised scientific uses.

The consistently high quality of Ilford products, evident in their standard photographic materials, has more than usual significance in Scientific Photography where precision is the basis of all research.

To assist you in your choice of Ilford Products, are the sole New Zealand Agents . . .

H. E. PERRY LIMITED

705 Colombo Street, CHRISTCHURCH. 'Phone 65-569.
29-33 Willeston Street, WELLINGTON. 'Phone 41-938.
198 Queen Street, AUCKLAND. 'Phone 48-646.
16 Manse Street, DUNEDIN. 'Phone 78-610.

SOME IMPORTANT OXFORD BOOKS

for the Entomologist

THE HONEYBEE: An Introduction to Her Sense-Physiology and Behaviour. By C. G. Butler. 146pp., $7\frac{1}{2}$ x 5, 7 plates. Cloth boards edition, 16/3 (N.Z.). Paper-backed edition, 6/9 (N.Z.).

BEES: Their Vision, Chemical Senses and Language. By Karl von Frisch. 136pp., $8\frac{3}{4}$ x $5\frac{5}{8}$, 61 illustrations. Published by Cornell University Press. Paper edition, 12/- (N.Z.).

AN INSECT BOOK FOR THE POCKET: By Edmund Sandars. 350pp., $6\frac{1}{8}$ x $3\frac{7}{8}$, 36 coloured plates, many line drawings. 19/3 (N.Z.).

A BUTTERFLY BOOK FOR THE POCKET: By Edmund Sandars. 332pp., $6\frac{1}{8}$ x $3\frac{7}{8}$, 63 coloured plates, 60 text figures. 19/3 (N.Z.).

Of all booksellers.

OXFORD UNIVERSITY PRESS

WELLINGTON.

THE NEW ZEALAND ENTOMOLOGIST

Vol. 2. No. 4. December, 1959.

CONTENTS

Page

DALE, P. S.: Notes on Some Insects and Other Invertebrates Collected in the Tokelau Islands 1

BULL, R. M.: A Note on the Occurrence of *Brullea antarctica* Castelnau (Coleoptera: Carabidae) at Otaki Beach 9

CUMBER, R. A.: Distributional and Biological Notes on Sixteen North Island Species of Formicidae (Hymenoptera) 10

ZONDAG, R.: Attack by *Calotermes brouni* Frogg. on Living *Pinus radiata* 15

TAYLOR, R. W.: The Australian Ant *Iridomyrmex darwinianus* (Forel) Recorded from New Zealand 18

TAYLOR, R. W.: A Note on the Status of the Ant Species *Monomorium* (*Notomyrmex*) *smithii* Forel (Hymenoptera: Formicidae) 20

WISE, K. A. J.: Insects on Citrus 22

TOWNSEND, J. I.: A Record of Sound Produced by the Larvae of *Tetrorea cilipes* White (Coleoptera: Cerambycidae) 25

PENDERGRAST, J. G.: The Occurrence of the Family Mesoveliidae in New Zealand 28

RAMSAY, G. W.: Notes on the Ecology of Some Cicadas in the Wellington District 29

MANSON, D. C. M.: An Insect and a Mite New to New Zealand 31

CUMBER, R. A.: A Record of *Xenophyes cascus* Bergroth (Homoptera: Coleorrhyncha) from the Waewaepa Range 33

Printed by
Otago Daily Times Co., Ltd., Lower High Street, Dunedin, N.Z.